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## **Suggested Self-Study Program for Instructional Systems Development (ISD)**

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If you are a novice instructional developer the following self-study program is designed to prepare you for a productive career in instructional system development. If you are a novice instructional designer you should read the first several books in the order indicated. They are arranged from the most fundamental to the more advanced. In the later sections the books are also arranged in order from the most fundamental to the more advanced.

### **Begin here**

Walter Dick, Lou Carey, James O. Carey (2000). **The Systematic Design of Instruction 5<sup>th</sup> Edition**. Addison-Wesley Pub Co. ISBN 0321037804.

This book is the classic in ISD. It is an excellent introduction to the process.

### **Or here**

Patricia Smith & Tillman Ragan (1999). **Instructional Design, 2<sup>nd</sup> Edition**. John Wiley & Sons 399 pages. ISBN 047136570X.

This is also a very good introduction to ISD. This book is also an excellent introduction to the process.

Either of these texts provides a very good introduction to the ISD process. These texts have introduced you to some instructional design principles. But, in order for your instruction to be really effective you need a more detailed presentation of some fundamental instructional design principles.

### **Read this next**

Ruth Clark (1999). **Developing Technical Training 2<sup>nd</sup> Edition: A Structured Approach for Developing Classroom and Computer-based Instructional Materials**. International Society for Performance Improvement. 238 pages. ISBN 1-890289-C7-8

This book describes instructional methods that are linked to five specific content types: facts, concepts, processes, procedures and principles. It is based on the work of M. David Merrill on Component Display Theory. "Academics often have difficulty communicating their theories, research findings, and methods to practitioners. Ruth Clark has a special gift to be able to interpret these complex ideas in a simple, straightforward way that is easily grasped and applied by practicing instructional designers. Those who apply the guidelines presented in Developing Technical Training will find that their instruction is far more effective."<sup>1</sup>

If you would like to read the "academic" version of Component Display Theory you may want to read M. David Merrill (1994). **Instructional Design Theory**. Educational Technology Pub. ISBN 0-87778-275-X.

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<sup>1</sup> Review of Developing Technical Training by M. David Merrill quoted on book cover.

You can also learn more about instructional strategies for teaching concepts from the following: M. David Merrill, Robert D. Tennyson, and Larry O. Possey (1992). **Teaching Concepts: An Instructional Design Guide 2<sup>nd</sup> Edition**. Educational Technology Pub. ISBN 0-87778-247-4

Perhaps you would like to be even better informed about some fundamental instructional design principles.

**You may want to read this as well**

Robert M. Gagné, Leslie J. Briggs, and Walter W. Wager. (1992). Principles of Instructional Design 4<sup>th</sup> Edition. Wadsworth Pub. Co. 365 pages. ISBN 00300347572

Having completed this course of study you will be able to design effective instruction. However, your knowledge will be primarily at a procedural level. You will only have a cursory understanding of why the prescriptions that have been recommended are important. You are now ready to read the two most important books ever written about instructional design and development. These books will take somewhat more concentration than those you have previously read will. But if you learn the material in these two books your skill as an instructional designer will be dramatically improved. You will graduate from beginner designer to **professional designer**.

**To become a professional designer read both of the following**

Robert M. Gagné (1985). **The Conditions of Learning and Theory of Instruction 4<sup>th</sup> Edition**. Holt, Rinehart and Winston. ISBN 0-03-063688-4

Robert M. Gagné was the father of modern instructional design. This book is a classic. It introduces you to information processing learning theory and then uses this theory to explain the nine events of instruction. Gagné's basic premise is that there are different kinds of learning outcomes and that each kind of learning outcome requires different instructional strategies (conditions) if learning is to occur. Research has demonstrated the fundamental validity of this assumption about learning.

While there are many interesting ideas and theories put forth especially during the past 10 years, Gagné still provides the most solid foundation for a science of instruction and a technology of instructional design. It was important because he founded his recommendations for instructional design in Information Processing Learning Theory and derived his prescriptions from this theory base.

Jeroen J. G. van Merriënboer (1997). **Training Complex Cognitive Skills**. Educational Technology Publications.

This book now ranks with Gagné as a fundamental foundation for instructional design. Whereas Gagne is based on the best theory available during the 60's, 70's and 80's van Merrienboer is based on the new theory in cognitive psychology available during the late 80's and 90's. This book should be must reading for all instructional designers.

This book it is the best integration of much of the current work in instructional design that is available. van Merrienboer's model integrates the best of both the instructivist and constructivist approaches to learning. He shows how these two ways of viewing instruction are both valuable and necessary to effective instructional design. He incorporates suggestions from the best of the instructional models that are summarized in other books such as Reigeluth's "Instructional Design Theories and Models, Vol. 2" and Tennyson, et al's "Instructional Design: International Perspective". He starts by summarizing important theory from cognitive psychology research and then relates the two aspects of instructional design, analysis and design, to this cognitive theory. Many of the prescriptions he suggests are supported by solid research that he cites. Finally, it is one of the best examples of technical writing that I have experienced. The content is complex but extremely easy to read. The organization of the book is tight, his summaries are concise and very helpful, he includes a list of all the important concepts introduced in each section, and he includes

suggested readings (not just references) for each section of the book. This book will become a classic in instructional technology.

If you have a reasonable grasp of the principles and practices presented in the above books you are prepared as a professional instructional designer/developer. However, there is still much to learn. These books have prepared you in the fundamentals of instructional design and development but they have merely introduced you to many related areas that are important to a professional developer. In the following paragraphs we suggest a reading program that will continue to enhance your skills and help you as you progress toward a **master instructional designer**.

## Learning Theory

Instructional design and development is very closely related to learning theory. While it is not necessary to be completely expert in learning theory the more you understand about the latest thinking in this important area the more effective your designs and instructional programs are likely to be.

### For a better grasp of learning theory as it applies to instructional design read

Ruth Clark (1998). **Building Expertise: Cognitive Methods for Training and Performance Improvement**. International Society for Performance Improvement. 204 pages. ISBN 1890289043.

"Dr. Clark has accomplished the feat of translating the classic theories of cognition and learning into practical advice for improving workplace performance. This is a perfect resource for anyone who never had the opportunity to study cognitive psychology -- or for those of us who did, but didn't have the advantage of such a good teacher as the author! No fads here -- just well-grounded and timeless concepts for designing messages to help others learn." (Diane M. Gayeski, PhD)

Bernice McCarthy (1996). **About Learning**. Excel, Inc. 452 pages. ISBN 0-9608992-9-4

McCarthy has captured the essence of the learning cycle and how learners interact with the various phases of learning. These ideas will provide a wonderful framework for understanding human learning. McCarthy is for me a recent discovery. This book is not a scientific treatise complete with footnotes and references, it is rather *scientific poetry*. And like all good poetry it penetrates not just the intellect but also the soul. And, after careful reflection, it has affected every aspect of how I think about instructional design. You too will be a better designer after studying this work.

Malcolm Fleming & W. Howard Levie (Editors) (1993). **Instructional Message Design: Principles from the Behavioral and Cognitive Sciences 2<sup>nd</sup> Edition**. Educational Technology Publications. 331 pages. ISBN 0-87778-253-9.

Ellen D. Gagné, Frank R. Yekovich, and Carol Walker Yekovich (1993). **The Cognitive Psychology of School Learning. 2<sup>nd</sup> Edition**. Addison Wesley Longman, Inc. 512 pages. ISBN 0673464164.

This is an excellent book, a must read for all instructional designers. It provides an explanation of "why" for many instructional prescriptions. It also suggests instructional prescriptions especially in areas of procedural learning.

Marcy P. Driscoll (1999). **Psychology of Learning for Instruction 2<sup>nd</sup> Edition**. Allyn & Bacon. 448 pages. ISBN 0205263216

## Instructional Technology

More and more instruction is becoming technology based. To be prepared as an instructional designer it is critical that you be informed about the new technologies and how they impact instruction. This area changes very fast. You should also subscribe to one or more of the current periodicals that report on developments in instructional technology.

**For in introduction to instructional technology read either**

Ann E. Barron & Gary W. Orwig (1997). **New Technologies for Education: A Beginner's Guide 3<sup>rd</sup> Edition.** Libraries Unlimited. ISBN 1563084775

**Or you may want to read**

Robert Heinich & Michael Molenda (1998). **Instructional Media and Technologies for Learning 6<sup>th</sup> Edition.** Prentice Hall. 428 pages. ISBN 0138591598.

**To learn how to effectively incorporate instructional media with instructional strategies the following is an excellent source.**

Diana Laurillard (1993). **Rethinking University Teaching: A Framework for the Effective Use of Educational Technology.** Routledge. ISBN 0415092892.

Don't let the "university teaching" part of the title through you off. This book is about instructional strategies and instructional technology as they apply in all instructional situations. It is perhaps the best exposition of how to incorporate instructional technology for more effective instruction. It should be must reading for every instructional designer.

**For specific design prescriptions for multimedia instruction you may want to consider one or both of the following.**

Tom Boyle and Tim Boyle (1996). **Design for Multimedia Learning.** Prentice Hall. 275 pages. ISBN 0132422158.

William W. Lee and Diana L. Owens (2000). **Multimedia-Based Instructional Design: Computer-Based Training, Web-Based Training, and Distance Learning.** Jossey-Bass. 304 pages. ISBN 0787951595.

## **Web-Based Training**

More and more training is being delivered over the internet. There are now tens of thousands of courses on-line. Many of them of very questionable quality.

**For learning to design web-based training consider one or both of the following:**

Margaret Driscoll & Larry Alexander (Editor) (1998). **Web-Based Training: Using Technology to Design Adult Learning Experiences.** Jossey-Bass Inc. 288 pages. ISBN 0787942030.

Brandon Hall (1997). **The Web-Based Training Cookbook.** John Wiley & Sons. 496 pages. ISBN 0471180211.

## **Computer-Based Training**

Computer-based training has become a very important vehicle for delivering instruction. This delivery system has moved from routine instruction to more and more complex objectives.

**For learning to design computer-based instruction consider one or both of the following:**

Stephen M. Alessi & Stanley P. Trollip (2000). **Computer Based Instruction.** Allyn & Bacon. 432 pages. ISBN 0205276911.

Andrew S. Gibbons & Peter G. Fairweather (1998). **Computer-Based Instruction.** Educational Technology. 570 pages. ISBN 0877783012.

## Simulation-Based Training

Simulation based training takes two forms: the high-end, real-world simulators like flight simulators that are very expensive to design and build and the desk-top part task simulation that can supplement other forms of training. The following source is concerned with desk-top simulation rather than full scale simulators.

### To learn to design simulation-based training consider the following

Douglas M. Towne (1995). **Learning and Instruction in Simulation Environments**. Educational Technology. 351 pages. ISBN 0877782784.

## Constructivist Instruction

There has been a great deal of recent attention to the philosophy of constructivism as it applies to instruction.

### For an introduction to some of the issues involved consider the following

Thomas M. Duffy & David H. Jonassen (Editors) (1992). **Constructivism and the Technology of Instruction: A Conversation**. Lawrence Erlbaum Associates. 221 pages. ISBN 0805812725.

### For some examples of instruction based on constructivist principles consider

Brent G. Wilson (1995). **Constructivist Learning Environments: Case Studies in Instructional Design**. Educational Technology Publications. ISBN 0877782903.

## Problem-Based Learning

Another current trend in instruction is problem-based scenarios or as the author of the following book calls them case-based scenarios.

### To learn more about problem-based learning consider the following

Roger C. Schank (Editor) (1997). **Inside Multi-Media Case Based Instruction**. Lawrence Erlbaum Associates. 451 pages. ISBN 080582538X.

## Analysis

Task analysis is a very important first step in the ISD process. The following recent books will expand your skills in this important area

David H. Jonassen, Wallace H. Hannum & Martin Tessmer (1999). **Task Analysis Methods for Instructional Design**. Lawrence Erlbaum Associates. 275 pages. ISBN 0805830863.

Allison Rossett (1999). **First Things Fast: A Handbook for Performance Analysis**. Jossey-Bass. 241 pages. ISBN 0787944386.

## Current Trends in Instructional Design and Technology

There are a number of excellent books, mostly collections of writing by a variety of authors, discussing some of the latest theories, models, and practices of instructional design and technology. The master instructional designer will want to read as much of this material as possible to be up-to-date with the most recent ideas in this dynamic field.

Charles M. Reigeluth (Editor) (1983). **Instructional-Design Theories and Models: An Overview of their Current Status**. Lawrence Erlbaum Associates. 487 pages. ISBN 0-89859-275-5.

A classic when it was published and still current. This very important work brought together the best known instructional theories of the 70's. Instructional design based on these theories is more effective and efficient than instructional design based on experience and common sense. These theories form the foundation of much that is currently being said about instructional design.

Charles M. Reigeluth (Editor) (1999). **Instructional-Design Theories and Models: A New Paradigm of Instructional Theory. Vol. II.** Lawrence Erlbaum Associates. 715 pages. ISBN0-8058-2859-1.

A collection of theories representing the considerable diversity available today for directing the design of instruction. Reigeluth tags these many approaches as a "new paradigm". They do in fact represent the current push on a more constructivist approach to instructional design. There is considerable emphasis on learner-centered, experience-based instruction. A very important source for instructional designers to enable you to become familiar with the current trends in instructional design, especially in the United States.

Tennyson, Robert D., Schot, Franz, Norbert, Seel & Dijkstra, Sanne. (Editors) (1997). **Instructional Design International Perspective Vol. 1 Theory, Research, and Models.** Lawrence Erlbaum Associates. 475 pages. ISBN 0-8058-1397-7.

We have a tendency in the USA to be very myopic in our view. We too often forget that we have very bright and important colleagues across the sea. Tennyson, with some European colleagues, has provided an extremely important collection of both European and USA theorists. Some of the chapters in this volume are classics and should be must reading for all instructional designers.

Sanne Dijkstra, Norbert Seel, Franz Schott & Robert D. Tennyson (Editors) (1997). **Instructional Design: International Perspective Vol. 2: Solving Instructional Design Problems.** Lawrence Erlbaum Associates. 418 pages. ISBN 0805814000.

George M. Piskurich, Peter Beckschi, and Brandon Hall (Editors) (1999). **The ASTD Handbook of Training Design and Delivery: A Comprehensive Guide to Creating and Delivering Training Programs -- Instructor-led, Computer-based.** McGraw Hill. 530 pages. ISBN 0071353105.

Charles R. Dills & A. J. Romiszowski (Editors) (1997). **Instructional Development Paradigms.** Educational Technology Publications. 882 pages. ISBN 08777882954.

**The following sources present a number of papers reporting research on instruction and related issues**

Sanne Dijkstra, Bernadette van Hout Wolters & Pieter C. van der Sijde (Editors) (1990). **Research on Instruction: Design and Effects.** Educational Technology Publications. ISBN 0877782210.

David H. Jonnassen (Editor) (1996). **Handbook of Research on Educational Communications and Technology.** Macmillan. 1267 pages. ISBN 0028646630.

## Some Related Issues

Are computers like people? Are they impersonal and indifferent? The following reports some very fascinating research that is very important to all designers of technology-based instruction.

Byron Reeves & Clifford Nass (1996). **The Media Equation: How People Treat Computers, Television, and New Media Like Real People and Places.** Cambridge University Press. 305 pages. ISBN 1-57586-053-8.

Design is a very general type of activity that takes in many fields. Often mistakes are attributed to people when the design of the artifact involved is the real cause of failure. We often make design decisions that cause students to fail. This failure is often attributed to student effort, ability, or motivation when in fact it

may be the instructional materials that are poorly designed. Don Norman's important little book should be read by every designer.

Donald A. Norman (1990). **The Design of Everyday Things**. Doubleday & Company. 256 pages.  
ISBN 0385267746,